REMARKS / ARGUMENTS

The action by the Examiner of this application, together with the cited references, has been given careful consideration. Following such consideration, claims 1, 7, 11, 13, 23 and 31 have been amended to define more clearly the patentable invention Applicants believe is disclosed herein. Claims 10, 15 and 30 have been canceled. Claims 2-6, 8-9, 12, 14, 16-22 and 24-29 remain unchanged by the present amendment. It is respectfully requested that the Examiner reconsider the claims in their present form, together with the following comments, and allow the application.

Applicants acknowledge the Examiner's indication that claims 17-22 are allowable.

In response to the Examiner's indication that claims 30 and 31 contain allowable subject matter, claim 23 has been amended to incorporate the limitations of claim 30. In addition, claim 31 has been amended to be dependent upon claim 23. It is believed that the foregoing amendments place claims 23-29 and 31 in condition for allowance.

Referring now to claims 1-16, as the Examiner well knows, these claims relate to a sensor for detecting hydrogen peroxide. The sensor is basically comprised of an element exhibiting piezoelectric properties having a metal-oxide containing coating thereon. The metal-oxide coating has a divalent or tetravalent state. In a preferred embodiment, the coating is lead dioxide (PbO_2). One advantage of the present invention is that the lead oxide coating exhibits a catalytic reaction with hydrogen peroxide. It is respectfully submitted that none of the cited references, alone or together, teaches, suggests or shows a sensor as presently set forth in the claims.

In response to the Examiner's comments, claim 1 has been amended to indicate that the metal-oxide coating on the piezoelectric element has a divalent or tetravalent state and further exhibits "a catalytic reaction with hydrogen peroxide."

Claim 7 has been amended to indicate that the piezoelectric crystal "supports" a lead dioxide (PbO_2) coating "on the surface thereof," and that such coating has a "catalytic reaction" with hydrogen peroxide.

Claim 11 has been amended to indicate that a "metal oxide in a divalent or tetravalent state" is supported on a substrate exhibiting piezoelectric properties. Further, the claim has been amended to indicate that the metal-oxide layer has a "catalytic reaction" with hydrogen peroxide so as to produce a change in the frequency of the sensor.

Claims 1, 2 and 10-15 stand rejected under 35 U.S.C. Section 102(b) as being anticipated by U.S. Patent No. 6,196,052 to May *et al.* The '052 patent discloses a gas-sensing device comprised of the piezoelectric element having a layer of "gas-retentive support material" thereon and a "gas-interactive material" associated with the gas-retentive support material. The '052 patent indicates that a "solid interaction product" is a result of the interaction between the "gas-interactive material" and the gas to be tested. (See column 4, lines 28-32 of the '052 patent).

The '052 reference does not teach, suggest or show a sensor for detecting hydrogen peroxide. Moreover, the '052 patent does not teach, suggest or show the use of lead oxide on a sensor. Still further, the '052 patent does not teach, suggest or show a sensor having a metal-oxide-containing coating wherein the metal oxide has a divalent or tetravalent state and exhibits a catalytic reaction with hydrogen peroxide.

For the foregoing reasons, it is respectfully submitted that claims 1, 7 and 11 are not anticipated by the '052 patent.

Claims 1 and 7 also stand rejected under 35 U.S.C. 102(b) as being anticipated by Ishihara *et al.* (Abstract of "Mixed oxide capacitor of barium titanate-lead oxide as a new type of carbon dioxide gas sensor"). For the Examiner's convenience, a copy of the entire article was obtained and is provided herewith.

Ishihara *et al.* disclose a capacitive sensor for the detection of carbon dioxide gas. The capacitive sensor has a mixture of barium titanate and lead oxide disposed between the plates thereof. As the barium titanate-lead oxide mixture is exposed to carbon dioxide gas, the dielectric constant of the mixture changes thus effecting a change in the capacitance of the sensor. The change in capacitance is used as a method of detecting and controlling the concentration of carbon dioxide gas in a region of space. Although barium titanate is a piezoelectric material, in the Ishihara *et al.* reference, the barium-titanate is mixed with lead oxide so as to create a compound that has a capacitance that is greater than either barium titanate or lead oxide alone (see page 1164, middle of the first full paragraph).

Ishihara *et* al. also disclose the detection of a change in the electrical property, i.e., the capacitance, of a sensor to determine the concentration of carbon dioxide gas. Ishihara *et al.* do not teach, show or disclose the use of the piezoelectric properties of barium titanate in its carbon dioxide gas sensor, but rather they disclose the use of barium titanate's semiconductive properties (see the middle of the first full paragraph on page 1164) in their carbon dioxide gas sensor.

It is respectfully submitted that the Ishihara et al. reference does not teach, suggest or show a divalent or tetravalent metal oxide that exhibits a catalytic reaction with hydrogen peroxide, as set forth in claim 1.

With respect to claim 7 of the present application, a frequency change of a piezoelectric material that supports a metal oxide coating is used to determine the concentration of hydrogen peroxide, i.e., a sterilant. In contrast to Ishihara *et al.*, the present application detects a gravimetric change, and not an electrical change, to sense a sterilant such as hydrogen peroxide in a region. It is respectfully submitted that one skilled in the art would not be motivated to take the teachings of Ishihara *et al.* – namely, the use of a compound mixture of barium titanate and lead oxide as a dielectric in a capacitive sensor wherein a change in the electrical properties of the sensor is detected to detect carbon dioxide gas – and apply them to the construction of a sensor that detects a sterilant by gravimetric means wherein a weight or mass change is detected by the sensor. Furthermore, it is respectfully submitted that Ishihara *et al.* do not teach, show or suggest the use of a piezoelectric material that supports a metal oxide in either the divalent or tetravalent state as a gravimetric sensor for the detection of a sterilant in a region.

In summary, it is respectfully submitted that the Ishihara *et al.* reference does not teach, suggest or show the sensors as presently defined in claims 1 or 7.

Applicants respectfully submit that neither the '052 patent nor the Ishihara *et al.* reference teach, suggest or show a hydrogen peroxide sensor as presently set forth in the claims. None of the references teaches, suggests or shows the use of lead oxide in a sensor for detecting

hydrogen peroxide, and do not show a sensor having a metallic oxide in a divalent or tetravalent state that exhibits catalytic reaction with hydrogen peroxide.

For the foregoing reasons, it is believed that the claims in their present form are distinguishable from the cited art, and favorable action is therefore respectfully requested.

Respectfully submitted,

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I hereby certify that this correspondence (along with any paper referenced as being attached or enclosed) is being deposited on the below date with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: April 8, 2005

Christine Goellner